BIBLIOGRAPHY OF PAPERS ON THE HISTORY OF NEPHROLOGY: PART VI

Again we bring the latest years' papers (2001) to your attention, together with a number of contributions from previous years not cited previously. And finally, a short summary of papers dealing with the subject of needles, intravenous fluids and hypodermic injections.

I - PAPERS ON THE HISTORY OF NEPHROLOGY PUBLISHED DURING 2001

General history of nephrology

Sorrentino F. Lettera al direttore (letter to the editor). Giorn Ital Nephrol 2001; 18: 86-88

- *this refers to the article by M Timio*: La scuola uronefrologica di Preci. Giorn Ital Nephrol 2000; 17: 532-535, listed above. *Sorrentino disagrees with many of Timio's conclusions on the history of lithotomy in Naples at that time.*

Richet G, Traeger J, Cameron JS, Fogazzi GB. Archivi storici della nefrologia Italiana: La nascità e lo sviluppo della nefrologia Italiana moderna visti da Parigi, Lione e Londra (Historical archives of the Italian society of nephrology. The birth and development of modern Italian nephrology as seen from Paris, Lyons and London). Giorn Ital Nefrol 2001; 18: 458-468.

- *personal recollections of the early development of Italian nephrology as seen by three foreign nephrolgoists with involvement in the Italian scene*

Gusmano R. La travagliata storia dell nascita della Società Italiana di Nefrologia Pediatrica (The troubled history of the birth of the Italian Society for Paediatric Nephrology). Giorn Ital Nefrol 2001; 18: 585-592

Richet G, Müller A. Le Premier Congres Internationale de Néphrologie Genève-Evian 1-3 Septembre 1960 (The first International Congress of Nephrology Geneva-Evian September 1-3 1960). Néphrologie 2001; 22: 175-177.

Michielsen P. Reflexions à propos du congres de Genève-Evian (Thoughts about the congress in Geneva and Evian). Néphrologie 2001; 22: 135.

Dunea G. History of nephrology. 1. Beginnings. Curr Survey World Lit 2001; 10: 237-41; 2. Continued *ibid* 11:1-6; 3. Concluded *ibid* 11: 49-54

- *these three brief articles contain an excellent summary of the history of nephrology, with most of the key references to secondary sources included*

Biographical studies and notes

[Hörl W. Laudatio: Professor Bruno Watschinger. Nephrol Dial Transplant 2001: 16; 184.]

Mason S. William Cumberland Cruickshank (1745-1800). Bull Roy Coll Surg Engl 2001; 83 (back cover portrait)

- this surgeon Cruickshank, a pupil of Hunter's, is often confused with the chemist William Cruickshank of Woolwich, who described and studied proteinuria in 1799 in Rollo's Diabetes (see Neild G 1998)

Anonymous. Laudatio: John Walls (1939-2001). Nephrol Dial Transplant 2001; 16: 195-1296.

Epstein FH. John P. Peters and Nephrology. Am J Kidney Dis 2001; 37: 1113-1119.

Carrera F. Fernando Valderrábano. In memoriam. Nephrol Dial Transplant 2001; 16: 2427-2438.

Anonymous. In memoriam: a commentary on R. Bernd Sterzel. Kidney Int 2001; 60: 2031-2.

Kerjaschki D, Kuntzendorf U, Luft FC, Mann JFE, Murer H, Stahl R, Weber M. In memoriam: a commentary on R Bernd Sterzel. Nephrol Dial Transplant 2001; 16: 2273-4.

Timio, M. Archivi Storici della Nephrologia Italiana: L'ascesa della nephrologia sulle spalle di un gigiante: Rchard Bright (The rise of nephrolgoy on the shoulders of a giant: Richard Bright. Giorn Ital Nefrol 2001; 18: 729-734.

Anon. Obituary: Jonas Bergström, MD, PhD (1929-2001): scientist, physician, researcher, mentor, musician and friend. Perit Dial Int 2001; 21: 543-545.

[Niaudet, P. Michel Broyer. Pediatr Nephrol 2001; 16: 1164-1165].

Parmiati Iriniy Evgenevny Tareevoi (Eulogy of Irina Tareeva). Klin Med (Moskva) 2001; 79: 80.

Tomilina N. Professor Irina Tareyeva. Nephrol Dial Transplant 2001; 16: 2108

Friedman EA, Bommer J. Peter Lundin (1944-2001) the physician/patient role model. Nephrol Dial Transplant 2001; 16: 2272.

Schneck P. Die Traubes: Geschichte und Leistungen einen jüdischen ärtze- und naturwissenschaftliche Familie in Berlin (History and achievements of a Jewish art- and science-loving family in Berlin). In: *Medizinische Bildung und Judentum.* Goldenbogen, Dresden 2001 pp 47-56.

- *Both Ludwig and Mauritz Traube contributed much to Nephrology and hypertension in the mid-19th century*

Renal disease in the classical and mediaeval world

Diamandopoulos AA, Goudas PC. Substitution of renal function through skin catharsis: evidence from the classical period to the middle ages. Kidney Int 2001; 59: 1580-1589.

Renal structure and function (anatomy and physiology)

Schmidt-Nielsen B, Sands JM. Milestones in nephrology. Reprint and discussion of: *Schmidt-Nielsen B. Urea excretion in white rats and kangaroo rats as influenced by excitement and diet. Am J Physiol 1953; 181 - …* J Am Soc Nephrol 2001; 12: 856-864.

De Bold A, Zeidel ML. Milestones in nephrology. Reprint and discussion of*: De Bold AJ, Borenstein HB, Veress AT, Sonnenberg H. A rapid and potent natriuretic reponse to intravenous injection of atrial myocardial extract in rats. Life Sci 1981; 28: 89-94.* J Am Soc Nephrol 2001; 12: 403-409.

- *the first description of ANP activity*

Moffat DB, Rollhäuser H, Kritz W. Milestones in nephrology. Reprint and discussion of: *Moffat DB, Fourman J. The vascular pattern of the rat kidney. J Anat Lond 1963; 97: 543-553.* J Am Soc Nephrol 1001; 12: 624-632.

Arosnson PS, Weinman EJ. Milestones in nephrology. Reprint and discussion of: *Kinsella JL, Aronson PS. Properties of the Na^+ – H^+ exchanger in renal microvillus membrane vesicles. Am J Physiol 1980; 238: F461-F469.* J Am Soc Nephrol 2001; 12: 1085-1095.

Anon. (S. Moss). Asparagusuria. Semin Dial 2001; 14: 140

- *controversy as to whether the well-known ability to smell asparagus secreted in the urine after a meal containing the vegetable is inherited or not*

Hargitay B, Thomas SR. English translation of and comment on: *Hargitay B, Kuhn W. Das Mutliplikationsprinzip als Grundlage der harnconzentrierung in der Niere (The*

mutiplication principle as the basis for concentrating urine in the kidney). Ztschr Elektrochemie Angewandt Phys Chemie 1961; 55: 539-558. J Am Soc Nephrol 2001; 12: 1566-1586.

- Bart Hargitay, the only survivor of the "original triumvirate that launched the hairpin countercurrent theory of urine concentration" discusses the events leading this momentous advance in renal physiology – arguably the most important series of papers on renal physiology in the second half of the 20th century, and to a certin extent neglected, perhaps because the paper had not hitherto been available in English translation.

Schlatter E, Hebert SC. Milestones in nephrology. Reprint and discussion of: *Greger R, Schlatter E. Presence of luminal K^+, a prerequisite for active NaCl transport in the cortical thick ascending limb of Henle's loop of rabbit kidney. Pflüger's Archiv 1981; 392: 92-94.* J Am Soc Nephrol 2001; 12: 1788-1793.

Frömter E, Boulpaep EL. Milestones in nephrology. Reprint and discussion of: *Frömter E, Gessner K. Free-flow potential profile along rat kidney proximal tubule. Pflügers Archiv 1974; 351: 69-83.* J Am Soc Nephrol 2001; 12: 2197-2206.

Strauss W, Christensen EI. Milestones in nephrology. Reprint and discussion of: *Strauss W. Cytochemical observations on the relationship between lysosomes and phagosomes in kidney and liver by combined staining for acid phosphatase and intravenous injected horseradish peroxidase. J Cell Biol 1964; 20: 497-507.* J Am Soc Nephrol 2001; 12: 2528-2537.

- the first description of lysosomes, preceding de Duve's paper

Schwartz, W.B., Verbalis,J.G. Milestones in nephrology. Reprint and discussion of: *Schwartz, WB, Bennett, W, Curelop S. A syndrome of renal sodium loss and hyponatremia probably resulting from inappropriate secretion of antidiuretic hormone. Am J Med 1957; 23: 529-542.* J Am Soc Nephrol 2001; 2860-2870.

- sadly, this was the last of the valuable series of "milestones" published in JASN during 1997-2001.

Aukland K. Odd E. Hanssen and the Hanssen method for measurement of single nephron glomerular filtration rate. Am J Physiol 2001; 281: F407-F413.

Urinalysis

Richet G. The osmotic pressure of the urine – from Dutrochet to Korányi, a trans-European interdisciplinary epic. Nephrol Dial Transplant 2001; 16: 42-424.

- a fascinating story of botanists, biochemists and clinicians

Anonymous (S.Moss). I had a glassen vessel. Semin Dialysis 2001; 14: 308

- *Van Helmont's first measurement of urine specific gravity in 1648, using rainwater as a comparator*

Connor H. Mediaeval uroscopy and its representation in misericords. I Clin Med 2001; 1: 507-509 *(for part II, see 2002 list).*

- *misericords are small fold-out seating supports, usually in the choir stalls of churches in England and Northern France, often decorated underneath with subjects from daily life as well as religious subjects*

Parenchymatous renal disease

Timio M. Archivi storici della nephrologia Italiana: disparate teorie su idropisia ed edema di due medici contemporanei: Ippolito Albertini e Michal Albertus (Historical archives of Italian nephrology: the opposing theories of dropsy and oedema of two contemporary physicians: Ippoliti Albertini and Michael Albertus. Giorn Ital Nephrol 2001; 18: 57-61.

Sirotin BZ, Keiser NP. On the history of the study of haemorrhagic fever with renal syndrome in eastern Russia. Nephrol Dial Transplant 2001; 16: 1288-1290.

Cameron JS. Editorial note (on the paper of Sirotin and Keiser) The history of viral haemorrhagic fever with renal disease (hantavirus). Nephrol Dial Transplant 2001; 12: 1289-1290.

- *these two papers report an early description of haemorrhagic fever in 1936 from Eastern Russia, and discuss this is a more general context*

Hostetter TH, Brenner BM, Meyer TW. Milestones in nephrology. Reprint and discussion of: *Hostetter TH, Olson JL, Rennke HG, Venkatachalam MA. Hyperfiltration in remnant nephrons: a potentially adverse response to renal ablation. Am J Physiol 1981; 241: F85-F93.* J Am Soc Nephrol 2001; 12: 1315-1325.

- *a paper that launched a thousand studies and speculations*

Anonymous (S. Moss). The renal affliction of Bonhomme John Paul. Semin Dialysis 2001; 14: 232.

- *this describes the post mortem (with renal histology), on Scottish-American naval hero John Paul Jones in 1905, 113 years after his death, which arose from glomerulonephritis possibly precipitated by malaria. (see Lasky II. N Y State J Med 1982; 1110-1115)*

Anonymous (S. Moss). Sip, sip, sippy. Semin Dial 2001; 14: 70

- the milk-alkali syndrome described by Hart and Rivers in 1923, resulting from the introduction by Sippy in 1915 of this type of treatment for peptic ulcers

Zhang Qianjin, Zhen Cheng. [History of nephritis] Chung-hua I Shih Tsa Chih 2001; 31: 36-40 (in Chinese)

Hoyer JR, Couser WG. Milestones in nephrology. Reprint and discussion of: *Hoyer JR, Raij L, Vernier RL, Simmons RL, Najarian JS, Michael AF. Recurrence of idiopathic nephrotic syndrome after transplantation. Lancet 1972; 2: 343-348.* J Am Soc Nephrol 2001; 12: 1994-2002.

- this paper pointed, for the first time, to a humoral factor underlying the proteinuria of minimal change disease and FSGS, and also strongly suggested they were two manifestations of the same entity

Toussaint C. La néphrose lipoïdique, le crapaud, la salamandre et le lombric. Un conte néphrologique exemplaire (Lipoid nephrosis, the toad, the salamander and the earthworm. An exemplary nephrological tale). Rev Méd Bruxelles 2001; 22: A120-A123.

- this describes the work of Paul Govaerts on oedema and proteinuria in the late 1920s and early 1930s. Govaerts was one of the first (along with Aschoff) to postulate and support the idea that proteinuria came predominantly from the glomerulus, and not the tubule as believed for the previous half century

Holubar K, Fatovic-Ferencic S. Cazenave, Kaposi and lupus erythematosus. Dermatology 2001; 203: 118-120.

Hypertension

Curtis JJ, Luke RG, Ritz E. Milestones in nephrology. Reprint and discussion of: *Curtis JJ, Luke RG, Dustan HP, Kashgarian M, Whelchel JD, Jones P, Diethelm AG. Remission of essential hypertension after renal transplantation. N Engl J Med 1983; 309: 1009-1015.* J Am Soc Nephrol 2001; 12: 2404-2412.

- the demonstration that in man, as in the rat, hypertension "follows the kidney"

Heidland A, Gerabeck W, Sebekova K. Franz Volhard and Theodor Fahr: achievements and controversies in their research in renal disease and hypertension. J Human Hypertension 2001; 15: 5-16.

Anonymous (S. Moss) The seventh day: day of unrest. Semin Dial 2001; 14: 75.

- long-term observations on spontaneous changes in blood pressure made by EA Brown in 1930, which observed that blood pressure was higher when the patient was at home at the weekends, and particularly on Sunday.

Ventura HO, Mehra MR, Messerli FH. Desperate diseases, desperate measures: tackling malignant hypertension in the 1950s. Am Heart J 2001; 152; 197-203.

Heidland A, Gerabek W, Sebekova K. Franz Volhard and Theodor Fahr: achievements and controversies in their research in renal disease and hypertension. J Hum Hypertens 2001; 15: 5-16.

Uraemia

Dialysis

Van Noordwijk R. *Dialysing for life.* Kluwer, Dordrecht, 2001.

- a fascinating personal account by a participant of the events surrounding the first successful haemodialyses in humans, performed by Kolff and his team in Kampen in Holland during and just after the second world war.

Fogazzi G. Archivi storici della nephrologia Italiana: Pietro Confortini (1924-1981): un chirurgo che dedicò la propria vita a combattere l'uremia (Historical archives of Italian nephrology: Pietro Confortini (1924-1981): a surgeon who devoted his life to combating uraemia). Giorn Ital Nefrol 2001 ; 18: 208-215.

- Confortini was amogst the first to use haemodialysis for the treatment of acute uraemia in Italy, and later introduced long-term dialysis to that country in the early 1960s. It is notable that all the earliest pioneers of haemodialysis in Italy were surgeons, including Confortini.

Shinaberger JH. Quantification of dialysis: historical perspective. Semin Dial 2001; 14: 238-245.

Peitzman S. Chronic dialysis and dialysis doctors in the United States: a nephrologist-historian's approach. Semin Dial 2001; 14: 200-208.

- a further fascinating analysis of the early days of chronic dialysis in the USA forma sociao-political perspective

Levy NB. Moment in history. In the beginning. ASAIO Journal 2001; 47: 9-10.

Paskalev DN. Georg Haas (1886-1971): the forgotten hemodialysis pioneer. Dial Transplant 2001; 30: 828-832.

- *not so forgotten today, perhaps, thanks to Benedum, Drukker and Ritz*

Transplantation

Murray JE, Carpenter CB. Milestones in nephrology. Reprint and discussion of: *Murray JE, Merrill JP, Harrison JH. Renal homotransplantation in identical twins. Surg Forum 1995; VI : 432-436.* J Am Soc Nephrol 2001; 12: 201-204.

- reprise of the first successful renal transplantation in humans

Anonymous (S. Moss). Cobalt blues. Semin Dialysis 2001 14: 134.

- a brief discussion of "cobalt bomb" irradiation for immunosuppression of transplant recipients in Paris in the late 1950s and early 1960s

Anonymous (S.Moss). The hem of the garment. Semin Dial 2001: 14: 76.

- an early attempt to transplant ovary and kidney together between dogs, by Carleton Dederer in 1920

Papalois VE, Najarian JS. Pediatric kidney transplantation: historic hallmarks and a personal perspective. Pediatr Transplant 2001; 5: 239-45.

Ogino Y. [Notes about two paintings in the Countway library of medicine]. Masui-Japanese Journal of Anaesthesiology 2001; 50:2039-9 (in Japanese)

- one is the famous picture of "The first operation under ether", and the other less the well-known "The first successful kidney transplantation" by Joel Babb.

Carrel A, Guthrie GC. (historical article). Anastomosis of blood vessels by the patching method and transplantation of the kidney. Yale J Biol Med 2001; 74: 243-247.

- *Carrel's description of the technique which made organ transplantation possible*

Miscellaneous

Timio M. Archivi storici della nefrologia Italiana: il ruolo della serendipità nella ricerca scientifica: esemplificazioni mediche (Historical archives of Italian nephrology: the role of serendipity in medical research: examples). Giorn Ital Nefrol 2001; 18: 351-355.

Houppermans RP, Brueren MM. Fysische diagnostiek – slagpijn in de nierloge (Physical diagnosis - pain elicited by percussion in the kidney area) Ned Tijdschr Gen 2001; 145: 208-210.

- percussion of the kidney using the fist was suggested by John Benjamin Murphy (1857-1916) as a way to diagnose renal colic or pyelonephritis

Bynum W. Discarded diagnoses: floating kidney. Lancet 2001; 357: 76.

Hepburn AL. The LE cell. Rheumatology 2001; 40: 826-7.

Skretepetis K, Siafakas I, Lykourinas M. Evolution of retrograde pyelography and excretory pyelography. J Endourol 2001; 15: 691-696.

II - PAPERS PUBLISHED UP TO THE END OF 2000, BUT NOT PREVIOUSLY LISTED

General history of nephrology

Diamandopoulos A, Scarpelos A. [Kidneys in battle: some reports from the last 400 years of Byzantium]. Deltos Journal 2000; 20: 4-11 [in Greek].

Biographical studies

Hargrave J. *The life and soul of Paracelsus.* Gollancz, London, 1951.

Toussant C. Paul Govaerts (1889-1960) Clinicien et physiologiste (Paul Govaerts (1989-1960) clinician and physiologist. Rev Méd Bruxelles 1999; 20: A59-A62.

- Govaerts did important work in a number of areas of nephrology, particularly his work around 1930 with Cordier and Gérard on the origin of proteinuria, which was at that time generally supposed to be tubular in origin, but which he demonstrated to be glomerular

Balogh F. Illyes Geza professzor. (Professor Gilya Ellyes). Orvosi Hetilap 2000; 141; 1088-1089.

Ioli A, Mento G, Venniro G, Savica V, Bellinghieri G. Marcello Malpighi. Am J Nephrol 1993; 13: 223-8.

Berliner RW, Giebisch GH. Robert Frankilin Pitts 1908-1977. Biographical memoir. Proc Natl Acad Sci USA 1987; 57: 322-344.

Eknoyan G. On the renal ailments of creators and leaders. Am J Kidney Dis 1993; 21: 1671-1676.

- *in the introduction to this bibliography I stated that I would NOT include papers on the renal ailments of the famous - but this key article is nevertheless, after all, worth citing.*

Gross AJ, Hummel G. Goethe almost died of urosepsis. World J Urol 1999; 17: 421-424.

- again this article is worth inclusion because of the picture it gives of contemporary treatments and medical thought. Goethe's physician also was Johann Christian Reil, a noted physician of the period who in his "Fieberlehre" of 1802 distinguished oedema of acute nephritis and the nephrotic sydrome for the first time (see Cameron 1988 earlier in this list)

Renal anatomy and physiology

Alexander RS. Pitts and urinary acidification. Physiologist 1983; 26: 384-386.

Mezzogiorno V, Mezzogiorno A, Passiatore C. A contribution to the history of renal structure knowledge (from Galen to Malpighi. Ann Anat 1993; 175: 395-401.

Grondona F. *La exercitazione anatomica di Lorenzo Bellini sulla struttura e funzione dei reni.* In Elscki (ed) Physis, Firenze 1963.

Nephrology in the ancient and mediaeval world

Urinalysis and uroscopy

Parenchymatous renal disease

Crissey JT, Parish LC. Vasculitis: the historical development of the concept. Clin Dermatol 1999; 17: 493-497.

Steensma DP. Fifty years of tart cells. Mayo Clin Proc 1999; 74: 936-8.

Wallace DJ, Lyon I. Peirre Cazenave and the first detailed modern description of lupus erythematosus. Sem Arthritis Rheum 1999; 28: 305-313.

Geidel H. 50 Jahre LE-Zelle – Beginn der Autoimmundiagnostik (Fifty years of LE cells - inception of autoimmune diagnosis). Zeitschr Rheumatol 1999; 58: 5-12.

Smolen JS. Zur Christian-Goerg-Schmorl-Gedachtnisvorlesung (The Georg Schmorl memorial lecture: 50 years of lupus erythematosus cells). Zeitschr Rheumatol 1999; 2-4.

Tan EM. The LE cell and its legacy. 1948. Clin Exp Rheumatol 1998; 16: 652-658.

- *these papers commemorate the half-century of the discovery of the LE cell phenomenon, like that of Tan in 2001 cited above*

Helbling F. Leitsymptome: Husten, Edeme, Proteinurie (Key symptoms: cough, oedema, proteinuria). Schweitz Ryn Med Prax 1998; 87: 1444-1448.

- *a historical case of tuberculosis, amyloidosis and a nephrotic syndrome*

Hörl W. Eingelander Kommentar zu: Hans Eppinger, Karl Kloss: was muss der praktische Arzt vom derzeitingen Stand der Nephritisfrage wissen? Wien Med Wschr 1920; 71: 38-40, 145-149,194-198. (Invited comments on : What must the practicing physician know about the nephritis question?) Wien Med Wschr 2000; 150: 71:194-8.

- a fascinating snapshot of knowledge of nephritis in Austria in 1920

Hypertension

Goodfriend TL. Angiotensin receptors: history and mysteries. Am J Hypertens 2000; 13: 442-449.

MacMahon HE. Renal changes in hypertension 1935. [historical article] Yale J Biol Med 2000; 73: 59-70.

Uraemia

Dialysis

Nosé Y. My life with Dr. Willem Kolff. Artificial Organs 1998; 22: 969-979.

Eggers PW. A quarter of a century of Medicare expenditures for ESRD. Semin Nephrol 2000; 20: 516-522.

Attrill E, Johnson HK. The cost of clinical dialysis – a historical perspective. Semin Nephrol 2000; 20: 523-525.

Plante CL. 1971 Medicare amendment: reflections on the passage of the end-stage renal disease Medicare program. Am J Kidney Dis 2000; 35[suppl 1]: s45-s48.

Scribner BH. Rationing dialysis in the early years. Semin Dial 2000; 13: 339.

Welch PG. Deployment of dialysis in the US Army: history and future challenges. Milit Med 2000; 165: 737-741.

Transplantation

Allison AC. Immunosuppressive drugs: the first 50 years and a glance forward. Immunopharmacol 2000; 47: 63 - 84

Miscellaneous

Lovaco Castellano F, Lopez Yanez P, Arias Funez F, Fernadez Gonzalez I, Otero Tejero I, Garcia Cuerpo E. Entorno historico de la litiasis cistinica (The historical setting of cystine lithiasis). Arch Espan Urol 1999; 52: 714-719.

III - A BIBLIOGPAHY OF THE INTRODUCTION OF NEEDLES AND SYRINGES INTO MEDICINE AND NEPHROLOGY

This is a subject hardly dealt with in this bibliography so far, despite the obvious importance of vascular access in fostering dialysis, and without which modern dialysis would be impossible. The history ***of the introduction of substances into the circulation*** *is a good deal longer than that of* ***the withdrawal of blood for analysis or dialysis****, and both follow from and relate to the* ***hypodermic injection of substances through needles.***

The history of blood transfusion and intravenous infusions has been dealt with in the following papers:

Brown HM. The beginnings of intravenous medicine. Ann Med Hist 1917; 1: 177-197.

Gamble JD. Early history of fluid replacement therapy. Pediatrics 1953; 11: 554-567.

Moon JB. Sir William Brooke O'Shaugnessy – the foundations of fluid therapy and the Indian Telegraph service. N Engl J Med 1967; 276: 283-284.

Howard-Jones N. Cholera therapy in the nineteenth century. J Hist Med 1972; 27: 373-395.

- Irishman O'Shaugnessy (1809-1889), then working as a young practitioner in Sunderland, first analysed with great clarity the electrolyte imbalance of the plasma in cholera in 1831, and suggested that intravenous infusions should cure this. These suggestions had also been made by two Russians, Hermann and Jaehnichen in Moscowand were taken up immediately by Thomas Aitchison Latta (1790?-1833) in Leith, Scotland – like O'Shaugnessy an Edinburgh graduate – who was able to save a number of individuals using (non-sterile!) i.v. infusions of salts. Similar observations were made by Magendie in Paris in the same year, 1832. However this logical treatment remained much less popular for the next half century than opium and, amazingly, purgatives.

Zimmerman, JJ, Strauss RH. History and current application of intravenous therapy in children. Pediatr Emergency Care 1989; 5: 120-127.

Barsoum N, Kleeman C. Now and then, the history of parenteral fluid administration. Am J Nephrol 2002; 22: 284-189.

- which last paper contains and extensive bibliography and relates how, after neglect during the 18th century, the great cholera epidemics of the 1820s and 1830s stimulated re-examination of intravenous therapy.

*The history of **needles** and **hypodermic injection** are inextricably entwined, as this was the main use for the first 50 years of their existence. Hollow steel needles were introduced and used to inject cadavers by A Neuner in 1827, and in 1844 Francis Rynd (1803-1861) of the Meath Hospital, Dublin, first used a trocar and cannula to infuse analgesics subcutaneously, although he had been preceded (especially in France) by several others (e.g. GV Lafargue of Saint-Emilion in 1836, and the early nephrologist Martin Solon) who inoculated morphine paste using a lancet or similar tool in humans, and a variety of other subtances in animals including strychnine.*

Anonymous. An historical instrument - Francis Rynd's apparatus for subcutaneous administration of fluids. J Roy Coll Surg Irl 1968; 4: 13.

Blake JB. Mr. Ferguson's hypodermic syringe. J Hist Med Appl Sci 1960; 15: 15: 337-341.

Brunton D. A question of priority. Alexander Wood, Charles Hunter and the hypodermic method. Proc Roy Coll Physcns Edinburgh 2000; 30: 349-351.

The steel needle and syringe combination manufactured by a Mr Daniel Ferguson of Giltspur Street, London was used first by Alexander Wood (1817-1884) of Edinburgh in 1853 for subcutaneous ("hypodermic") injections of substances; Wood appears to have been ignorant of Rynd's work of 1844, which although published in Ireland the following year, was not know widely until 1861. Thereafter progress was rapid and the technique widespread, with glass and vulcanite replacing metal from the work of Herman Wulfing Luer in Paris in 1894, and many others elsewhere. See the comprehensive review :

Howard-Jones N. A critical study of the origins and early development of hypodermic medication. J Hist Med Appl Sci 1947; 2: 201-249.

*- which deals incidentally with" **the Pravaz legend",** by which (mainly for chauvinistic reasons so far as one can see) the hypodermic syringe and method were falsely attributed to Frenchman Charles Gabriel Pravaz of Lyon (1791-1853) – a veterinarian who in fact performed intra-arterial injections on animals, and not subcutaneous injections in humans. This misconception was (and is) widely cited as correct. Howard-Jones points out that if priority is important, then in fact the first to perform both intravenous and subcutaneous injection of substances must have been an anonymous - but venomous- snake.*

See also

Pfender C. Historical synopsis of the development of hypodermic medication. Washington Med Ann 1911-2; 346-359.

Schwidetzky O, Rutherford NJ. History of syringes and needles. Curr Res Anaesth Analg 1944; 23: 34-38.

Gottfried O. The history of the hypodermic syringe. NY Physician and American Medicine 1953; 41: 2-6.

Anonymous. The evolution of the hypodermic syringe. Bull Nat Inst Nutrition 1953; 3: 1-2

Anonymous. Evolution of the hypodermic syringe and other instruments of parenteral therapy. Chemist and Druggist 1953; 607-611.

- *these three papers marked the centenary of the first use of the hypodermic syringe*

Goodman H. The hypodermic syringe. Med Times 1956 (June) 625-634

Pelczar ME. Vascular access: an historical review. Asepsis 1996; 18: 9-13.

Carey J, Smith RM. Jr. Needles, past present and future. J Am Ass Nurse Anesthetists 1972; 40: 104-107.

Kirkup J. Surgical history. The history and evolution of surgical instruments VIII. Catheters, hollow needles and other tubular instruments. J Roy Coll Surgeons Eng 1998; 80: 81-92.

Lawrence G. Tools of the trade. The hypodermic syringe. Lancet 2002; 359: 1074.

Incredibly, no-one seems to have thought of using a needle to ***withdraw blood*** *for therapeutic or investigative reasons for 225 years following the introduction of hollow instruments (quills, silver cannulas) placed into veins and arteries. This occurred as early as 1657-1669 by, amongst others, Sir Christopher Wren (1632-1723), who used quills rather than the silver tubes employed by others; whilst in 1662 Johann Daniel Major (1634-1793) advocated removal of blood to "thin the circulation" and Matthias Purmann in 1667 described the preliminary withdrawal of blood before the injection, using a piston-type syringe, of therapeutic agents.*

Gabriel Richet has argued persuasively that this idea of blood withdrawal through an intravenous needle, rather than phlebotomy using a lancet or scarification and cupping, remained new when Hermann Strauss described his flanged needle for the purpose as late as 1902. (H. Strauss. *Die chronische Nierenen-entzündingen* August Hirschwald, Berlin, 1902).

Richet G. Le prélèvement veineux à l'aiguille de H Strauss. Début de la biochimie du sang (The removal of venous blood using the needle of H Strauss. The beginning of the biochemistry of the blood) . La Presse Méd 1992; 21: 1053-1054.

The history of syringes and syringing themselves is a little oblique to our present argument, but plunger syringes perhaps orginated in Albucasis in the 10th century

Spink MS, Lewis GL. *Albucasis on surgery and instruments.* Wellcome Insittute, London 1973. Pp 406-409.

and were certainly known to Brunschwig in 1479 (Dis ist das Buch der Cirurgia. Gruniger, Strasbourg, 1479, Fol. XIX) and half-century later to Ambroise Paré for washing wounds and for enemas.

There has yet to be published a comprehensive history of access for haemodialysis. One paper (listed in this bibliography previously) which deals with one aspect is

Twardowski Z. Intravenous catheters for hemodialysis: historical perspective. Int J Artif Organs 2000; 23: 73-76.